CHAPTER 7

LEARNING OBJECTIVES

INTRODUCTION

What are learning objectives? Why are learning objectives used? Perhaps you have asked yourself these or very similar questions. An objective is a description of a performance you want students to demonstrate before you consider them competent. An objective describes an intended result of instruction. Objectives provide direction for instruction, guidelines for testing, and convey instructional intent. Objectives provide the foundation upon which course curriculum is built as well as the road map for the delivery of course content. They define what you will teach and how you will measure student accomplishment of learning objectives. In addition to having a knowledge of the purposes of objectives, you must have an understanding of the classifications, elements, and types of learning objectives.

LEARNING OBJECTIVE CLASSIFICATION

Instructional objectives are broadly classified as knowledge or skill objectives. The "Taxonomy of Educational Objectives," was developed to help identify and define instructional objectives. This classification system, is based on the assumption that learning outcomes can best be described as changes in student behavior. The taxonomy is divided into three main parts or domains: (1) the cognitive, (2) the affective, and (3) the psychomotor. This chapter concentrates on the cognitive and psychomotor domains because of their application to Navy training.

THE COGNITIVE DOMAIN

The cognitive domain contains the following six major categories. The example given in each category illustrates the level of understanding the student should be able to demonstrate as a result of the instruction provided.

Knowledge (Level 1)

Knowledge is defined as the remembering of previously learned information. All that is involved is the recall of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain. Objectives at this level require students to demonstrate their knowledge of the subject, but not their understanding of it.

EXAMPLE: State the three elements of learning objectives.

Comprehension (Level 2)

Comprehension is defined as the ability to grasp the meaning of material. These learning outcomes are more complex than simple recall of information and represent the lowest level of understanding.

EXAMPLE: Explain the use of oral questions in a lesson introduction.

Application (Level 3)

Application is the ability to apply learning in new and concrete ways. Application differs rom comprehension in that application shows that a student can use (apply) learning correctly.

EXAMPLE: Demonstrate effective communication skills and techniques.

Analysis (Level 4)

Analysis is the ability to separate material into its component parts to arrive at an understanding of its organizational structure. Analysis requires a higher level of understanding than either comprehension or application. Learning outcomes that involve decision making, problem solving, or troubleshooting skills normally require this level of understanding.

EXAMPLE: Distinguish between appropriate and inappropriate motivation techniques.

Synthesis (Level 5)

Synthesis refers to the ability to reason from the general to the particular. Synthesis stresses creative behavior that combines many parts into a meaningful whole.

EXAMPLE: Prepare self, materials, and environment to deliver instruction.

Evaluation (Level 6)

Evaluation involves the ability to judge the value of material based on defined criteria. Learning outcomes of this category contain elements of all the other cognitive categories in addition to value judgments. This category represents the highest level of understanding within the cognitive domain.

EXAMPLE: Evaluate the effectiveness of another instructor's performance.

When using the objectives in this domain, you must make sure they are realistic. You must

make sure they reflect an accurate indication of the desired learning outcomes and, in fact, measure what you think they are measuring. You cannot measure level three outcomes by level one objectives. Nor can you measure student comprehension by asking "recall" level questions.

The responsibility for ensuring learning outcomes falls largely to you, the instructor. If the intended outcome of instruction is for the student to be able to "apply" theory, principles, or concepts (level three of the cognitive domain), then objectives must developed and taught at that level.

Domains involve a "hierarchy" of learning outcomes. Those outcomes allow you to provide instruction in a defined sequence. Thus, you present facts, methods, basic procedures, and terminology. Then you can measure your students' accomplishment of those objectives (by testing) before teaching higher levels of information.

The objectives show students what they are expected to learn from instruction. The objectives tell the instructor at what "level" to present information. If the purpose of a topic, as defined by the learning objectives, is to cover information at the knowledge level, be careful not to go into too much detail. Conversely, if the purpose is to teach students to apply the information presented, don't make the critical error of presenting information only at the knowledge level.

THE AFFECTIVE DOMAIN

The affective domain defines learning outcomes associated with emotions and feelings, such as interest, attitudes, and appreciation. Measuring the accomplishment of objectives in the affective domain is generally more difficult than in the other domains. In this domain we are not only interested in a "correct response" but also in determining the student's feeling, attitude, and interest toward the subject.

THE PSYCHOMOTOR DOMAIN

In Navy training a large percentage of course objectives are associated with the cognitive domain while a relatively small percentage are associated with the affective domain. Because of the nature of technical training, the Navy places a great deal of emphasis on learning outcomes of the psychomotor domain.

In the chapter on "Principles of Learning," you read about the ways people learn. They included imitation, trial and error, transfer, association, and insight. While none of these ways are unique to any one domain, imitation, trial and error, and transfer are closely associated with the psychomotor domain.

Students accomplish much of their skill learning by imitating behaviors they observe in others. They acquire some skills by trying something until they hit upon a satisfactory (though not necessarily correct) solution or outcome.

Transfer, you remember, is applying past learning in new ways. You cannot always provide students with skill training on actual equipments. Thus, you must strive to create realistic learning situations that will enable students to "transfer" that learning to their actual job.

The categories of the psychomotor domain are as follows:

Perception (Level 1)

Perception concerns the students' use of their sensory organs to obtain cues that guide their motor activity. It involves the students' learning from sensory stimulation (awareness of a sight, sound, or scent) and from recognition of the stimulus (identification of the object, sound, or scent) to perform certain actions.

EXAMPLE: Choose appropriate colored markers for lettering charts.

Set (Level 2)

Set refers to the student's being ready to perform a particular action. Perception of cues serves as an important prerequisite for this level. This category includes mental set (mental readiness to act), physical set (physical readiness to act), and emotional set (willingness to act).

EXAMPLE: Display proper student behavior in a learning environment.

Guided Response (Level 3)

This level involves the early stages of learning a complex skill. It includes learning through imitation and trial and error. Adequacy of performance is normally judged by another person or by the use of defined criteria.

EXAMPLE: Display proper instructor behaviors in a training environment.

Mechanism (Level 4)

This level concerns performance skills of which the learned responses are more practiced than in the previous level, but are less complex than the next higher level. You expect the student to be able to perform these skills with some degree of confidence and proficiency.

EXAMPLE: Use the chalkboard/visual aids panel as instructional media.

NOTE: Before going onto the next level, we must point out that this example objective could apply equally as well to levels two and three as it does to level four. Obviously, however, you would measure student accomplishment of the objective differently. You should expect much more of a student in the way of proficient performance at level four than at level two. That is why you need to understand the intended level of the instruction and the learning outcomes expected as a result of that instruction. While that is specifically the responsibility of curriculum developers, you, the instructor, must accomplish the desired training outcomes of the learning objectives.

Complex Overt Response (Level 5)

At this level within the domain, you should expect the student to demonstrate a high degree of proficiency. This level includes highly coordinated motor activities.

EXAMPLE: Demonstrate the procedure for disarming live ordinance.

Adaptation (Level 6)

Adaptation concern highly developed skills. Transfer learning is associated with this level in that students use previously learned skills to perform new but related tasks.

EXAMPLE: Adapt your instructional style to the appropriate level of the students.

NOTE: You are more likely to find behaviors at levels six and seven outside of the training environment because of their complexity. The example objective used in level six might be more appropriate to an evaluation program for experienced instructors than to students in an instructor training course.

Origination (Level 7)

Origination refers to a student's ability for new and creative performance after having developed skill. Learning outcomes at this level emphasize creativity in responding to a particular situation or specific problem.

EXAMPLE: Develop alternative strategies for delivering instruction.

The "Taxonomy of Educational Objectives" provides a three-domain system for the classification of instructional objectives. Each domain is subdivided into categories arranged in hierarchical order from simple to complex. These categories aid in (1) identifying objectives for an instructional unit, (2) stating objectives at the proper level for the defined learning outcome, (3) defining objectives in the most relevant terms, (4) checking the comprehensiveness of objectives, and (5) communicating to others the nature and level of intended learning outcomes.

LEARNING OBJECTIVE ELEMENTS

Learning objectives are composed of three elements: the behavior, the condition, and the standard. These elements define what the student will be able to do, under what conditions, and to what degree of proficiency.

THE BEHAVIOR ELEMENT

The behavior defines what the learner should be able to do as an outcome of training. It may include application of knowledge, accomplishment of a skill, or demonstration of an attitude. This element of the objective always specifies student performance. You must be able to observe the behavior and to measure what the student must do to demonstrate accomplishment of the objective. The significant parts of the behavior element are the (1) subject, (2) performance-oriented verb, and (3) object.

The student is always the subject. Commonly, the phrase: "Upon successful completion of this topic, the student will be able to . . ." introduces learning objective statements. When a topic lists several learning objectives, the introductory statement appears once with all of the objectives grouped beneath it.

The performance-oriented verb, or "action" verb, immediately follows the introductory statement and expresses the student performance required to demonstrate achievement of the objective. Learning objectives should contain only verbs that express active, measurable performance. Objectives should not contain verbs that are vague, such as "understand," "know," and "realize," as they are open to interpretation and can be measured in many different ways.

The object of a behavior element is a word or phrase that denotes what is acted upon. The object should include all modifiers needed to define what the student will be acting upon. For example, consider the following objective: "Upon successful completion of this topic, the student will be able to state the three elements of a learning objective." The "student" is the subject, "state" is the action verb, and the phrase "the three elements of a learning objective" is the object.

THE CONDITION ELEMENT

The condition basically defines aiding and limiting factors imposed upon the student in satisfying the performance requirements of the objective. This element may also define the degree of interaction with the training environment that the learner may expect. One of the major concerns in Navy training is to ensure that the conditions of the training environment approach those of real life. You may encounter objectives that contain several conditions or none at all. In some instances, objectives may contain no aiding or limiting factors, or the conditions of performance may be obvious. The objective should not include conditions that are not legitimate training concerns. The following are some examples of conditions:

. . . given a list of . . .

. . . without the use of references . . .

. . . provided with a Model X calculator . . .

. . . in a damage control wet trainer . . .

When combined with the behavior element, the condition element provides a clearer understanding of the learning outcome defined by the objective.

THE STANDARD ELEMENT

The standard specifies the criteria the students' performance must meet. Standards are normally defined as time, accuracy, quantity, speed, or some other quantifiable measurement. As with the condition element, whether the standard element appears in the objective depends on how critical it is to determining the students' accomplishment of the objective. If you must measure student accomplishment against some criteria, then the learning objective will include the standard element. If not included, the standard is assumed to be 100 percent. Examples of standards are as follows:

. . . 40 words per minute.

. . . plus or minus one gram.

. . . without error.

TYPES OF LEARNING OBJECTIVES

There are several types of objectives you may encounter due to different terminology between various development approaches. The types you are most likely to find, however, are course, terminal, topic, and enabling objectives.

Course Learning Objectives (CLOs). CLOs reflect the specific skills and knowledge required in a job. The CLOs serve as a guide for learning and as a guide for teaching. They also serve as a guide for the instructor in measuring student performance and in duplicating job requirements in the training environment.

Topic Learning Objectives (TLOs). TLOs support course learning objectives. They state performance (behaviors), conditions, and standards for knowledge and skills students must acquire as a result of satisfactorily completing the topic.

Terminal Objectives (TOs). A terminal objective is a specific statement of the performance expected from a student as the result of training. It expresses the behavior to be exhibited, the condition(s) under which it is to be exhibited, and the standard to which it will be performed. TOs directly support the course mission statement.

Enabling Objectives (EOs). An enabling objective is a specific statement of the behavior to be exhibited, condition(s) under which it is to be exhibited, and the standard to which it will be performed. Enabling objectives contain conditions and standards appropriate to the training environment, including knowledge and skills that support a terminal objective.

CONSTRUCTION OF LEARNING OBJECTIVES

Although the writing of learning objectives is not difficult, it can present a challenge. Developers must determine the desired learning outcomes and the conditions under which the student must perform. They must also decide how to determine when a student has satisfactorily met the training requirement. After that, the information is converted into words that convey the message. Remember the following information about the construction of

learning objectives:

- Learning objectives indicate what the student will be able to do as a result of training.
- The student is always the subject of the behavioral statement. The behavioral statement will also contain a performance-oriented verb and an object.
- Most objectives describe conditions that aid or limit performance.
- Standards describe the criteria of acceptable performance. They are usually expressed as time, accuracy, or quality. The lack of a stated standard implies that 100 percent accuracy is required.

Learning objectives of Navy training courses normally fall into the categories of knowledge, mental skills, or physical skills. These objectives all contain the same elements but are written to determine different levels of understanding or achievement. For example, the following three behavioral statements pertain to the same subject but are written to determine various learning outcomes.

Upon completion of this topic, the student will be able to:

- (Knowledge) State Ohm's Law for determining voltage in a series circuit.
- (Mental Skill) Solve for an unknown value in a series circuit.
- (Physical Skill) Measure current in a series circuit.

These statements all indicate WHAT the student is expected to be able to do as a result of training. When the CONDITION statements are added, the aiding or limiting factors to performance will be known:

- State Ohm's Law for determining voltage in a series circuit from memory.
- Solve for an unknown value in a series circuit when provded with two known values.
- Measure current in a series circuit using the Model XX Multimeter.

When the STANDARD is added to these statements, the objectives will be complete. They will tell the students exactly what they will be expected to do, under what conditions, and the criteria of acceptable performance:

- State Ohm's Law for determining voltage in a series circuit from memory. (The standard of 100 percent is implied).
- Solve for an unknown value in a series circuit when provided with two known values. Problems must be solved accurate to two decimal points.
- Measure current in a series circuit using the Model XX Multimeter. Measurements must be within plus or minus one milliamp of those specified on Maintenance Care 1-2-3.

These examples illustrate the development of learning objectives intended to measure various levels of student achievement. You should remember and apply the knowledge for which learning objectives are written so that you can achieve specific learning outcomes. As an instructor, you are in a unique position. You will be able to determine if training is producing students with the knowledge and skills they need to perform the jobs to which they will be assigned.

SUMMARY

Learning objectives provide the foundation upon which course curriculum is built. They define what you teach and provide the basis for measurement of student accomplishment. Instructional objectives are broadly classified as knowledge and skill objectives. These classifications are divided into levels of learning within the cognitive and psychomotor domains. Your knowledge of the classification, elements, types, and construction of learning objectives will clarify your role in conducting training and strengthen your effectiveness in delivering training.